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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,631	11/09/2001	Daniel S. Pickard	S01-079	1649
30869	7590	06/07/2005		
LUMEN INTELLECTUAL PROPERTY SERVICES, INC. 2345 YALE STREET, 2ND FLOOR PALO ALTO, CA 94306			EXAMINER NGUYEN, JOSEPH H	
			ART UNIT 2815	PAPER NUMBER

DATE MAILED: 06/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/007,631

Applicant(s)

PICKARD ET AL.

Examiner

Joseph Nguyen

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-13, 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Sverdrup, Jr. et al. (US 6,060,839).

Regarding claim 1, Sverdrup, Jr. et al. discloses on figure 4 a semiconductor source of emission electrons comprising a target 24 (col. 2, line 29) comprising a wide bandgap semiconductor, said target having a target thickness between an illumination surface and emission surface of said target; and a means (col. 3, lines 15-16) for producing and directing a beam 76 of seed electrons at said illumination surface; a means 75 (col. 3, lines 22-23) for controlling an energy of said seed electrons such that said seed electrons generate electron hole pairs in said target and a fraction of said electron pairs supply said emission electrons (col. 2, lines 25-28).

Note that the amended limitation “wherein said target thickness and the energy of said seed electrons are optimized such that said seed electrons *do not fully penetrate said target* and said emission electrons are substantially thermalized at said emission surface” is merely functional language and therefore not structurally distinguishable from Sverdrup, Jr. et al. The device of Sverdrup, Jr. et al. is capable of functioning as

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claimed, and further there must be absorption of primary electrons in the target to produce secondary electrons and therefore primary electrons do not all "fully" penetrate. Moreover, Sverdrup, Jr. et al. only teaches in col. 2, lines 29-31 the thickness of diamond 24 is *preferably* matched to the energy of electrons such that electrons fully penetrate diamond. It means that the thickness of diamond and the energy of electrons can be adjusted such that electrons do not fully penetrate diamond. In other words, the target thickness less than full penetration depth is known though not preferred.

Regarding claim 2, Sverdrup, Jr. et al. discloses said wide bandgap semiconductor 24 has a negative electron affinity at said emission surface (col. 2, lines 38-40).

Regarding claim 3, Sverdrup, Jr. et al. discloses said wide bandgap semiconductor comprises a material selected from the group consisting of diamond (col. 2, line 26).

Regarding claim 4, Sverdrup, Jr. et al. discloses the wide bandgap semiconductor is diamond and the emission surface is hydrogen terminated for generating the negative electron affinity (col. 3, lines 48-52).

Regarding claim 5, Sverdrup, Jr. et al. discloses the wide bandgap semiconductor comprises a means (col. 3, lines 48-52) for generating the negative electron affinity at the emission surface.

Regarding claim 6, Sverdrup, Jr. et al. discloses the means for generating is a material coating (col. 3, lines 48-52).

Regarding claim 7, Sverdrup, Jr. et al. discloses the wide bandgap semiconductor is diamond and said material coating comprising Cs (col. 3, lines 50-52).

Regarding claim 8, Sverdrup, Jr. et al. discloses a means (col. 3, lines 25-26) for drawing the emission electrons from within the target to the emission surface.

Regarding claim 9, Sverdrup, Jr. et al. discloses the means for drawing comprises a built in electric field induced by a bandgap ramp (col. 3, lines 25-35).

Regarding claim 10, Sverdrup, Jr. et al. discloses the means for drawing comprises an external applied electric field penetrating the target (col. 3, lines 25-26).

Regarding claim 11, Sverdrup, Jr. et al. discloses on figure 5 a means 32 (col. 4, line 21) for producing and directing a beam of said emission electrons.

Regarding claim 12, Sverdrup, Jr. et al. discloses on figure 5 the means 32 (col. 4, line 21) for producing and directing comprises an external applied electric field.

Regarding claim 13, Sverdrup, Jr. et al. discloses on figure 5 the means 32 for producing and directing comprises an external applied magnetic field.

Regarding claim 23, in a similar manner as rejection of claim 1 above, Sverdrup, Jr. et al. discloses all steps of the method in claim 23.

Regarding claim 24, Sverdrup, Jr. et al. discloses the step of producing and directing a beam of the emission electrons to an application unit (col. 4, lines 20-22).

Regarding claims 25 and 27, the claim language is merely the intended use and therefore does not structurally distinguish from Sverdrup, Jr. et al.

Regarding claim 26, Sverdrup, Jr. et al. discloses the application unit is a display for employing the beam of emission electrons in an image display (col. 4, lines 20-25).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sverdrup, Jr. et al.

Regarding claims 14 and 15, Sverdrup, Jr. et al. teaches in col. 3, lines 39-43 the energy spread of the emission electrons (current of emission electrons) can be varied with increasing or decreasing primary electron energy. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Sverdrup, Jr. et al. by varying the primary electron energy to produce the energy spread of the emission electrons at the emission surface of less than 1 eV (for claim 14) and less than 0.1 eV (for claim 15), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sverdrup, Jr. et al., and further in view of Baum et al. (US 5,684,360).

Regarding claim 16, Sverdrup, Jr. et al. discloses on figure 4 substantially all the structure set forth in the claimed invention except the means for producing and directing the beam of seed electrons comprising a photocathode and a light source for photo induced generation of the seed electrons from the photocathode. However, Baum et al. discloses on figure 1 the means for producing and directing the beam of seed electrons comprising a photocathode 10 (col. 3, lines 30-31) and a light source 50 (col. 5, line 38) for photo induced generation of the seed electrons from the photocathode. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sverdrup, Jr. et al. by having the means for producing and directing the beam of seed electrons comprising a photocathode and a light source for photo induced generation of the seed electrons from the photocathode for the purpose of producing high brightness, small diameter electron beams (col. 1, lines 10-11, Baum).

Regarding claim 17, Baum et al. discloses the photocathode 10 comprises a negative electron affinity photocathode (col. 4, lines 38-39).

Regarding claim 18, Sverdrup, Jr. et al. discloses the means for producing and directing the beam of seed electrons comprises a voltage source 46 (col. 4, lines 17-19) for applying an electric field to the seed electron.

Regarding claim 19, Sverdrup, Jr. et al. discloses the means for producing and directing the beam of seed electrons comprises a unit 46 (col. 4, lines 17-19) for applying a magnetic electric field to the seed electron.

Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sverdrup, Jr. et al., and further in view of Fox et al. (US 5,592,053).

Regarding claim 20, Sverdrup, Jr. et al. discloses on figure 4 substantially all the structure set forth in the claimed invention except the means for producing and directing the beam of see electrons being a field emission source. However, Fox et al. discloses on figure 1 the means 20 for producing and directing the beam of see electrons being a field emission source (col. 5, lines 15-16). In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sverdrup, Jr. et al. by having the means for producing and directing the beam of see electrons being a field emission source for the purpose of improving diamond electron beam device capable of high temperature operation (col. 2, lines 2-3, Fox et al.).

Regarding claim 21, Sverdrup, Jr. et al. discloses the means for producing and directing the beam of seed electrons comprises a voltage source 46 (col. 4, lines 17-19) for applying an electric field to the seed electron.

Regarding claim 22, Sverdrup, Jr. et al. discloses the means for producing and directing the beam of seed electrons comprises a unit 46 (col. 4, lines 17-19) for applying a magnetic electric field to the seed electron.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.



**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

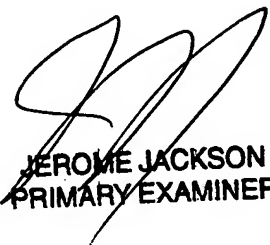
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JN  
June 2, 2005.



JEROME JACKSON  
PRIMARY EXAMINER